



# ICAO ENGINE EXHAUST EMISSIONS DATA SHEET

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: Trent 1000-E BYPASS RATIO: 9.7  
 UNIQUE ID NUMBER: 12RR058 PRESSURE RATIO ( $\pi_{00}$ ): 36.2  
 COMBUSTOR: Phase5 Tiled  
 ENGINE TYPE: TF RATED THRUST ( $F_{00}$ ) (kN): 268.0

REGULATORY DATA **\*\* DATA SUPERSEDED \*\*** SEE FOLLOWING UID FOR REVISED DATA: **12RR064**

CHARACTERISTIC VALUE:	HC	CO	NO <sub>x</sub>	SMOKE NUMBER
D <sub>p</sub> /F <sub>00</sub> (g/kN) or SN	0.1	16.1	47.7	6.5
AS % OF ORIGINAL LIMIT	0.7	13.7	42.5	36.0
AS % OF CAEP/2 LIMIT (NO <sub>x</sub> )			53.1	
AS % OF CAEP/4 LIMIT (NO <sub>x</sub> )			60.1	
AS % OF CAEP/6 LIMIT (NO <sub>x</sub> )			66.9	
AS % OF CAEP/8 LIMIT (NO <sub>x</sub> )			76.3	

### DATA STATUS

- PRE-REGULATION  
 x CERTIFICATION  
 x REVISED (SEE REMARKS)

### TEST ENGINE STATUS

- NEWLY MANUFACTURED ENGINES  
 x DEDICATED ENGINES TO PRODUCTION STANDARD  
 - OTHER (SEE REMARKS)

### EMISSIONS STATUS

x DATA CORRECTED TO REFERENCE  
 (ANNEX 16 VOLUME II)

### CURRENT ENGINE STATUS

(IN PRODUCTION, IN SERVICE UNLESS OTHERWISE NOTED)  
 x OUT OF PRODUCTION (DATE: - )  
 - OUT OF SERVICE (DATE: - )

### MEASURED DATA

MODE	POWER SETTING (%F <sub>00</sub> )	TIME (minutes)	FUEL FLOW (kg/s)	EMISSIONS INDICES (g/kg)			SMOKE NUMBER
				HC	CO	NO <sub>x</sub>	
TAKE-OFF	100	0.7	1.907	0.00	0.46	36.29	4.2
CLIMB OUT	85	2.2	1.579	0.00	0.42	28.62	5.2
APPROACH	30	4.0	0.549	0.00	0.99	12.16	3.1
IDLE	7	26.0	0.217	0.10	11.20	5.00	0.6
LTO TOTAL FUEL (kg) or EMISSIONS (g)			758	34	4041	12165	-
NUMBER OF ENGINES				4	4	4	4
NUMBER OF TESTS				8	8	8	8
AVERAGE D <sub>p</sub> /F <sub>00</sub> (g/kN) or AVERAGE SN (MAX)				0.1	15.1	45.4	6.0
SIGMA (D <sub>p</sub> /F <sub>00</sub> in g/kN, or SN)				0.1	3.6	0.6	2.3
RANGE (D <sub>p</sub> /F <sub>00</sub> in g/kN, or SN)				0-0.25	10.79-19.28	44.82-46.14	3-8.3

### ACCESSORY LOADS

POWER EXTRACTION 0 (kW) AT - POWER SETTINGS  
 STAGE BLEED 0 (% CORE FLOW) AT - POWER SETTINGS

### ATMOSPHERIC CONDITIONS

BAROMETER (kPa)	98.9-102.1
TEMPERATURE (K)	284.1-293.2
ABS HUMIDITY (kg/kg)	0.00432-0.00968

### FUEL

SPEC	
H/C	1.9
AROM (%)	17.4

MANUFACTURER: Rolls-Royce plc  
 TEST ORGANIZATION: Rolls-Royce  
 TEST LOCATION: Derby  
 TEST DATES: 24/09/2009-03/08/2012

### NO<sub>x</sub> REGULATION PARAGRAPH

	2.3.2 c) (CAEP/4)
	2.3.2 d) (CAEP/6)
x	2.3.2 e) (CAEP/8)

### REMARKS

1. Representative of Package B engines
2. DNS170301
3. Certification in accordance with Part III, Chapter 2, of Amendment 7 of ICAO Annex 16 Vol. II.
4. NO<sub>x</sub> levels in accordance with Part III, Chapter 2, 2.3.2 e) (CAEP/8)

Compliance with Fuel Venting requirements: x ('x' if complies, 'PR' if pre-regulation, '-' if information is not available)